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EMOTIONAL ADJUSTMENT OF VISUALLY-HANDICAPPED ADOLESCENTS

DAVID H. MORGAN

California School for the Blind

Within the past fifty years, the measurement and guidance program has developed rapidly. Valid and reliable instruments have been constructed for determining the inteligence of individuals ranging in age from early childhood to the adult level.

Although the determination of mental capacity was an arduous and elusive task, the scientific measurement of emotional stability has been even more complex. Measurement in this field is many years behind the progress made in mental testing; yet, to the educator the location of neurotic tendencies before they become serious behavior problems is as important as is the determination of mental capacity—possibly more important. The seriously maladjusted child cannot be expected to develop to the full extent of his capabilities.

Since the present devices for measuring emotional stability are mainly questionnaires, they have been discarded by many educators as of little value because of the many weaknesses in this form of data-gathering device. However, until better forms of measurement are devised, we should investigate fully the possibilities of using the existing instruments in determining maladjustment. The children now in school under our guidance need all the assistance that we can give them.

The purpose of the present investigation is to study the emotional adjustment of the pupils in a residential school for the blind. The problem has been divided into the following questions:

1) How do the boys and girls in a residential school for the blind compare, in terms of emotional adjustment, with each other and with samplings reported upon in the literature?

2) To what degree is a measure of emotional adjustment related to such factors as degree of vision, chronological age, number of years in the residential school for the blind, and intelligence?

3) What association exists between the emotional adjustment score of the pupil and his behavior record in the school and in the dormitory?

RELATED STUDIES

Behavior disorders have received extensive attention in the literature during the last few decades. However, the studies reviewed here will be confined merely to those presenting a background pertinent to the problem under consideration or bearing directly upon the problems involved in identification of potential behavior disorders among blind children.

Emotional development.—Jones *et al*[4], in a comprehensive treatment of emotional and social development and the educative process, pointed out that early studies of stimulus-response relationships in anger and fear created the mistaken belief that emotional processes were 'all or none' and that the child was free from emotion unless he exhibited vigorous symptoms of a disturbed condition. There was a general tendency to regard emotions as more or less stereotyped reaction patterns, similar in some respects to simple reflexes. The present tendency, according to the above authors, recognizes that emotional components are in some form and to some extent present in all behavior. As the child matures, pressure towards more socialized behavior results in restrictions upon frank emotional response. The task of the teacher becomes more difficult as more subtle forms of expression develop which elude recognition and diagnosis.

Most of the troublesome forms of emotional disturbance in childhood, according to the above citation, may be interpreted in terms of some felt inadequacy in the child's adjustment to his physical and social environment. He worries about the future, his dreams, magic, death, and the life hereafter. His world is complex and mysterious. A series of fear responses may develop and may emerge, unless maintained at a low level of overt activity in the form of worries and anxieties, as psychoses or at least neuroses. When apparent crises do appear, they

seem to be related to certain social factors rather than to biological determinants. The most effective method of producing desirable behavior, as well as of eliminating undesirable behavior, is probably the reinforcement of the child's underlying security or self-confidence rather than an attack on the symptom.

Diagnosis of behavior problem.—As pointed out by Epstein[3] in 1941, we lack standards of behavior evaluation which would enable us to establish generally useful criteria in identifying behavior problems. The child who is a problem to one teacher is rarely a problem to all of his teachers. Of the total population included in this study 12.7 per cent were selected by one or more teachers as problem children. The reasons given by the teachers for designating the children as 'problems' were typical of those reported in other studies: lack of interest in work, inattention, lack of study, irregular attendance, laziness, dull mentality, day-dreaming, disturbance of class routine, selfishness, talkativeness, 'cuteness,' and carelessness.

Williams[6] stated in 1941 that teachers tend to identify the problem child by his antagonism to authority and to the teachers' moral concepts, and to ignore his purely personal problems, such as shyness, fearfulness, or unhappiness. However, Burleson[2] in a report of three years of experience in a coöperative study of personality disturbances among children in a school system presented evidence to show that, through practice and training, teachers may be made aware of obscure physical handicaps which change personality. The teachers looked for the cause rather than at the symptom.

Neurotic tendencies of blind children.—In one study of emotional disturbances among blind children, Brown[1] reported a statistically significant difference between the responses of two hundred eighteen students in schools for the blind and those of three hundred fifty-nine high-school seniors to the *Clark Revision of Thurstone Personality Schedule*, with the blind exhibiting more neurotic tendencies. This difference was contributed mainly by the blind girls who had significantly higher scores than did the sighted girls. The scores of the blind and the sighted girls were significantly higher than those of boys in the corresponding group. However, Brown pointed out that reliable differences between sex groups in the various schools failed to show significance differences except that the girls in one school were

significantly different (higher) from those in the others. He stated that differences within schools, conceivably due to disciplinary or instructional procedure, colored his results to a considerable degree.

Only a negligible relationship was found between IQ and gross scores, for both the sighted ($r = .04 \pm .04$) and the blind ($r = .06 \pm .04$). Likewise, for the sighted, little relationship ($r = -.13 \pm .08$) was found between age and gross scores.

THE PRESENT STUDY

Description of test.—The *Personal Index** by Loofbourow and Keys was selected for use in this study. It consists of a battery of three tests, selected from ten types of tests, which have been validated by extensive studies of children in the public schools and in a state school for delinquent boys.

The first test, "False Vocabulary," contains one hundred words, thirty of which are fictitious. The respondent is asked to state whether or not he knows the word.

The second test, "Social attitudes," has seventeen words or phrases with four statements under each which describe certain attitudes regarding the word or phrase. Three of the four statements are socially unacceptable.

The last test, "Adjustment Questionnaire," contains eighty-nine yes-no questions for which unfavorable responses have been found to be indicative of emotional instability.

Administration of test.—All of the boys and girls twelve years of age or older in a residential school for the blind over a four-year period were asked to take the test in groups of ten to thirty-seven. The instructions as outlined in the Manual[5] were followed with certain changes. They read as follows:

> This is a new kind of test we are trying today. The purpose is not to find out how much you know or can do, but to see what kind of things you know most about, and how you feel about many matters. The answers you give will have nothing to do with your grades in any subject. They will make no difference that way. So don't bother about whether your answer is one that will please me or not, just so it shows the way you really feel about the question.

---

* Published by Educational Test Bureau, Minneapolis, Minnesota.

To which was added the following:

> No one is compelled to take this test. We are giving it to you in order to find out more about you so that we may be better able to help you when you come to us for advice. If you find that you would rather not answer the questions, or cannot answer them truthfully, please do not take the test. Remember that you do not have to take the test.

Only one boy, however, declined to coöperate. Wholehearted coöperation was given by the other pupils, and there was no indication that the responses were other than sincere. In fact, after having taken the test, a number of the pupils requested conferences for the discussion of problems. This lowering of the barrier between the school and some of the pupils has in itself justified the time devoted to the study.

There is no time limit on the test, but, according to the authors, "even junior high school pupils should easily finish in thirty-five minutes." However, since the test blanks were not available in braille, it was necessary for the examiner to administer the test orally. The total time required was slightly over two hours because no individual could progress faster than the slowest. To eliminate fatigue, the test was given in two sections, on different days. Each item was read twice before the pupils were allowed to respond. If a pupil was still in doubt as to the wording, the item was repeated when he raised his hand. If the pupil raised his hand after the second reading of an item in Test 1, False Vocabulary, the word was spelled.

The pupils recorded their responses in braille on the regular paper used in their school work. After the number of the item, they wrote 'y' or 'n' for the yes-no items and 'T' or 'F' for the true-false items. For the multiple-choice items of Test 2, the letters, 'a,' 'b,' 'c,' and 'd,' were assigned to the various possible answers. Thus the amount of writing was kept to a minimum.

One factor did appear in the testing situation which might possibly affect the validity of the test, a factor which probably also appears in the testing of sighted children. Occasionally there would be laughter in some of the groups as a consequence of items in Test 2 and Test 3. The pupils were impressed with the fact that every item was a description of the way some person

felt and that, while it might seem funny to some, it was a worthwhile point and should be answered the way each person felt. This factor was kept to a minimum by the smallness of the groups.

Reliability of test.—The authors of the test report the reliabilities of the individual sub-tests determined by the method of split-halves and the Spearman-Brown formula to be as follows in order: .881, .842, and .924, the reliability of the test as a whole being .948. This statistical technique is the one commonly employed for tests of this nature, although it is open to the criticism that relatively temporary influences, such as attitudes and feelings, which would differ on another occasion, affect the scores on both halves of the test in the same way.

As a matter of interest, the writer repeated Test 3, two days after the first administration to the last group tested. This group, numbering thirty-seven, was the largest tested at one time. One 'smart' pupil concluded that the first papers had been lost. Being rather proud of himself for making this 'discovery,' he passed it on to the others. The pupils were simply asked to respond truthfully to the questions. None were required to participate. When one girl asked if she should give the same answers as before, she was told that her answer should be the true one and that she was the only one who could determine the truthfulness.

Naturally there are many uncontrolled factors which will affect such a procedure, most of which operate to lower the reliability since the transfer effect is probably negligible. The small number of subjects also gave considerable weight to marked variations in responses by a few individuals. Therefore, it was rather surprising when a figure of .86 was obtained. The scores on the retest were, on the average, seven points lower than those on the first test; twenty-five pupils had fewer than six changes; four, between six and eight changes; and eight—four boys and four girls—between eleven and eighteen. Three of these boys and two of the girls were considered definitely to be behavior problems. One of the boys has since been expelled and the other placed on probation. It may be that this marked change in score was an evidence of maladjustment.

Description of group tested.—The population included in this study was, on the average, 15.8 years of age, in the eighth grade—which is three grades lower than would be expected for the age—

and average in intelligence. Although the group had been aware of defective vision for thirteen years, only 3.6 of those years had been spent in this school for the blind (Table 1). As shown by the measures of variability, the standard deviation, and the range, the sample was heterogeneous.

TABLE 1.—STATISTICS OF DISTRIBUTION OF SCORES FOR MEASURES USED IN DESCRIBING SAMPLE

Measure	Boys (62)		Girls (66)		Total (128)		
	Mean	SD	Mean	SD	Mean	SD	Range
IQ*	102.8	19.4	99.9	18.6	101.5	19.1	61–180
CA	15.5	2.3	16.1	2.1	15.8	2.2	12–22
Years visual handicap recognized	13.3	4.2	12.9	4.6	13.1	4.4	1–22
Grade	7.7	2.1	8.1	2.1	7.9	2.1	2–12
Years in this school	3.4	3.0	3.8	3.3	3.6	3.2	0–13
Year retarded	2.9	2.1	3.0	2.0	3.0	2.0	−1.5–9.5

* Hayes-Binet Tests for the Blind administered by the writer.

The average scores of the girls for the previously mentioned measures were slightly higher than those of the boys except for

TABLE 2.—SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS OF DISTRIBUTIONS OF SCORES FOR BOYS AND GIRLS ON MEASURES USED IN DESCRIBING SAMPLE

Measure	Difference* between Means of Boys and Girls	Standard Error of Difference	D/SE
CA	.6	.39	1.5
Grade	.4	.37	1.1
IQ	−2.9	3.54	0.8
Years in this school	.4	.56	0.7
Years visual handicap recognized	−.4	.78	0.5
Years retarded	.1	.36	0.3

* Minus sign indicates that the mean for the boys was higher than that for the girls.

'years visual handicap recognized' and IQ. However, for no measure was the mean difference between the groups statistically significant from zero, or even approaching significance, in that no difference was more than 1.5 times its standard error. (Table 2.) The greatest difference between the sexes was in age.

Comparison of adjustment scores of visually handicapped pupils with those of boys in regular schools and in state reform school.— The authors of the *Personal Index* state as follows:

> A score of 35 may deserve attention, as such scores are made by about three-fourths of the reform school boys as compared with only one in five of the control group. Scores above 40 are usually significant of maladjustment, while those of 50 or 60 are highly indicative and occur but rarely in the group rated satisfactory (5:5).

A high percentage of both the boys (sixty-five per cent) and the girls (seventy per cent) included in this study made scores of 35 or higher, (Table 3). The cumulative percentages of the boys and the girls with high scores approximated more closely those of the boys in the reform school than those of the boys in the city schools. It seems evident, then, that the extent of maladjustment in the California School for the Blind and other comparable schools may be expected to exceed greatly that in

TABLE 3.—PERSONAL INDEX SCORES OF BOYS AND GIRLS IN SCHOOL FOR BLIND CONTRASTED WITH THOSE MADE BY BOYS IN CITY SCHOOLS AND IN STATE REFORM SCHOOL (5:4, TABLE 1)

Personal Index Score*	City Schools Cumulative per cent of boys	State Reform School Cumulative per cent of boys	School for Blind Cumulative per cent		
			Boys	Girls	Total
70 or higher....	0.4	8	2	5	3
60 or higher....	2	21	11	9	10
50 or higher....	5	41	32	24	28
40 or higher....	13	63	52	48	50
35 or higher....	21	74	65	70	67
30 or higher....	32	82	74	83	79
20 or higher....	63	94	90	97	94
10 or higher....	92	99	100	100	100

* A high score is indicative of maladjustment.

the regular schools and to approach that found in a reform school.

For comparing the boys and the girls in the California School for the Blind in emotional adjustment, the statistics of the distributions of the *Personal Index* scores were computed. (Table 4.) In opposition to the findings reported by Brown[1], only a slight difference in mean score, far from being statistically significant from zero, was found between the emotional adjustment scores of the sexes. Although the distribution of scores for the boys was slightly more variable than that of the girls, this difference is likewise not statistically significant.

TABLE 4.—COMPARISON OF STATISTICS OF DISTRIBUTION OF PERSONAL INDEX SCORES FOR BOYS AND GIRLS IN RESIDENTIAL SCHOOL FOR BLIND

Statistic	Boys	Girls	Diff.	SE diff.	D/SE
Mean	40.9	41.2	.3	2.53	.1
Standard Deviation	14.9	13.7	1.2	1.49	.8

Relationship of various measures to Personal Index score.—As shown by the product-moment coefficients of correlation for the entire group (Table 5), only two of the measures considered in this study seem to be associated with the *Personal Index* scores: the number of years during which the visual defect had been recognized, and the intelligence of the child. Although both of these values are low, .25 and −.29, they are still more than four times their probable error. The negative coefficient for intelligence correlated with *Personal Index* score indicates an inverse relationship; those children with a high IQ are less maladjusted (better adjusted) than are the children with a low IQ. This finding is in contrast to the negligible relationship reported by Brown[1].

For the girls, a relationship approaching significance was found between the *Personal Index* score and the number of years retarded (.31 ± .08). The coefficients for the boys, other than the two mentioned above for the entire group, were all negligible.

When the sample was sub-divided according to vision, it was found that, on the average, the totally-blind boys and girls were better adjusted, as measured by the *Personal Index*, than were the partially-sighted children. Likewise the partially-sighted pupils who were either print or print and braille readers were, as

a group, better adjusted than were the sight-saving pupils.* The numbers of cases in the various categories are so small, however, that these results must be verified in a larger group

TABLE 5.—RELATIONSHIP BETWEEN VARIOUS MEASURES AND SCORES MADE BY BOYS AND GIRLS IN THE CALIFORNIA SCHOOL FOR BLIND ON PERSONAL INDEX

Score on *Personal Index* correlated with	Boys		Girls		Total Group	
	r	PEr	r	PEr	r	PEr
IQ	−.23	.08	−.37	.07	−.29	.06
Years blind	.25	.08	.26	.08	.25	.06
Years retarded	.02	.09	.31	.08	.16	.06
Grade	.01	.09	−.26	.08	−.12	.06
Years in C.S.B	−.03	.09	.14	.08	.06	.06
CA	.05	.09	−.01	.08	.02	.06

before any generalization can be derived. The ranges in scores for the various groups were very similar.

TABLE 6.—PERSONAL INDEX SCORES OF BOYS AND GIRLS IN RESIDENTIAL SCHOOL FOR BLIND, CLASSIFIED ACCORDING TO VISION

Vision	Boys			Girls			Total		
	N	Mean	Range	N	Mean	Range	N	Mean	Range
Blind	18	36.9	10–59	21	37.2	10–79	39	37.1	10–79
Partially Sighted									
Braille readers	22	39.1	10–69	29	44.4	25–28	51	42.1	10–84
Braille and print readers	4	49.5	27–62	8	38.0	20–58	12	41.8	20–62
Print readers	18	45.9	27–71	8	45.8	20–64	26	45.8	20–71

Behavior record of pupils making high Personal Index score.—Space does not permit a case study report on all the individuals

* These pupils have a visual acuity in the better eye greater than 20/200 and less than 20/70. Large print, rather than braille, is recommended for their use.

TABLE 7.—PERSONAL INDEX SCORES OF PUPILS DROPPED FROM SCHOOL BECAUSE OF DISCIPLINE PROBLEMS

Personal Index Score	Boys, Number	Girls, Number
70–74	1	0
65–69	2	0
60–64	1	0
55–59	1	0
50–54	3	1
45–49	0	1
40–44	2	1
35–39	1	1
Total	11	4

who made high scores on the *Personal Index*. However, a preliminary survey of the data revealed that the four girls and the eleven boys who had been dropped from the rolls of the

TABLE 8.—CLASSIFICATION OF BOYS AND GIRLS IN RESIDENTIAL SCHOOL FOR BLIND WITH PERSONAL INDEX SCORES ABOVE 45 AND BELOW 30 ACCORDING TO BEHAVIOR

Score	Boys		Girls		Total	
	Behavior Problem	No Problem	Behavior Problem	No Problem	Behavior Problem	No Problem
70 and above.....	1	0	2	1	3	1
60–69.....	4	2	2	1	6	3
50–59.....	8	4	7	3	15	7
45–49.....	3	2	4	2	7	4
Total.....	16	8	15	7	31	15
20–29.....	3	7	0	9	3	16
10–19.....	0	6	1	1	1	7
Total.....	3	13	1	10	4	23

school during the years of this study had made scores above 35. (Table 7.)

When the data were examined in terms of behavior problems present among those pupils who had scored above 45 points, it was found that four of the six girls and five of the seven boys who had scored above 60 were recognized problems in the school or in the dormitory. (Table 8.) Those classified here as behavior problems are the ones who were reported to the principal and the superintendent on a number of occasions by the supervisors in the dormitories and by the teachers. In all, two-thirds of the group with scores above 45 were guilty of repeated overt acts which brought them to the attention of the school authorities.

An analysis of the behavior records of those pupils who scored below 30 points revealed that none had been expelled from the school and that only four of the twenty-seven were considered behavior problems. (Table 8.)

DISCUSSION

As one would expect, the percentage of the boys and girls included in this study who evidenced maladjustment was larger than that of boys in the regular public schools, but was lower than that of boys in a state reform school. The very presence of a child in a school for the blind indicates a major barrier or obstacle in his life which must be faced and conquered. In some cases this handicap is further complicated by low mentality, speech disorders, which may of course be a product of the emotional strain resulting from the visual defect, glandular disturbances, and various other disorders. It is essential for the administrators, teachers, and supervisors in residential schools for the blind to be conscious of these facts in their daily relations with the child.

In generalizing the above finding, one must consider the possibility, even probability, that the sample in a residential school for the blind is not representative of the total population for the State of children with visual handicaps. Those children with partial vision who readily adjust to school work tend to remain in the regular public schools while the problem children are most likely to be referred to the school for the blind.

Contrary to the results of Brown's study,[1] there was no significant difference between the sexes either in mean score or in variability. As Brown mentioned, the results from one school

cannot be applied to another, in that the administrative policy may have a definite influence upon the results. Since the policy of the California School for the Blind is to provide opportunity for general development, and since the rules are only such as are necessary for maintaining the general moral and physical welfare of the child, the girls are only slightly more restricted than are the boys.

The significant inverse relationship found between intelligence and maladjustment may be attributed in part to the ability of the brighter pupils to obtain a greater satisfaction from success in school work. Those of low intelligence may develop a feeling of being 'good for nothing,' and consequently their attitudes may be less socially acceptable. These children, who are likely to be overlooked, should receive more attention than they probably do in locating tasks which they can successfully master and in gaining recognition from the group. Therefore, any activity program designed to provide opportunity for self-expression should be broad in scope.

The California School for the Blind has an excellent reputation for the number of pupils who have continued their academic training through college and, in a number of cases, have obtained advanced degrees. Therefore, the bright pupil could look forward to a number of years in school before the problem of locating a position would arise. On the other hand, little encouragement could be offered by the School or by the Bureau of Vocational Rehabilitation at that time to those who did not hope to attend college. Positions were not open to the blind as they are at the time of this writing.* More information is needed before it can definitely be concluded that there is any relationship between intelligence and adjustment among the blind.

The significant, although low, positive relationship between maladjustment and the number of years in which the visual defect had been recognized is not the result one would normally

* In the spring of 1943, an employer, for the first time in the eight years during which the writer has been connected with the school, interviewed the writer *at the school* relative to the employment of those pupils, male or female, who were to graduate that year. Three were employed in that one shop alone during the summer. By fall of 1943, more positions were open for blind workers than there were qualified workers. Housewives were begging for boys to work in their gardens and girls to work in their homes after school hours. The demand was many times greater than the supply.

expect. Conceivably the longer one is blind, after the first initial shock, the more one would become adjusted. Possibly, then, over the age range of this study, the effect of the visual defect upon emotional development is cumulative. This problem is worthy of further study as the findings presented here are only indicative, not conclusive. It is not inconceivable that during certain stages in the life of the blind child a readjustment to the blindness is necessitated as problems, such as those relative to employment and to relations with members of the opposite sex, appear which were not present at an early age.

As would be expected, a slight positive relationship was found between retardation and maladjustment, since in many cases the child worries about falling behind his younger siblings or his friends in the regular school and since in other cases the child, because of his visual trouble, has been excluded from much of the work in the regular public school classes, and consequently upon entrance in a school for the blind has been placed in a class below that to which he had been 'socially' promoted. From observation only, however, it has been found that the child is happy when he discovers work which he can successfully perform with a class. The fact that the group on the average was retarded three years probably minimizes the relationship with maladjustment.

Although there was no indication of a relationship between chronological age and adjustment, in the age range included in this sample, a study of the relationship between physiological age or social age and adjustment might reveal further insight into the problems connected with the emotional development of children with visual defects. It is possible that certain peak periods of maladjustment might be located and identified as possible danger points in the development of the child.

The low average *Personal Index* score of the totally-blind children, as contrasted with the high scores of the partially-sighted, especially the 'sight-saving' pupils, is not surprising to one connected with a residential school for the blind. These partially-sighted pupils cannot be considered representative of the partially-sighted pupils in the public schools. In many cases they were sent to the school for the blind because they were problem children in more ways than in reading. Also, experience has shown that more opposition to a school for the blind is

found among parents of partially-sighted pupils, as well as among such pupils themselves, than is found among the parents of the totally-blind child.

In one instance a guardian of a partially-sighted boy, who was visiting the school against her wishes at the request of the local school system, was quite frank in her expression as we visited one class. She exclaimed: "There's nothing wrong with his eyes, but if there was I would rather see him dead than blind." Four years later, this partially-sighted boy enrolled as a senior in high school. The remaining time in school was so short and his attitudes were so firmly established that much had been left undone when he had completed his work although his progress was remarkable and gratifying.

Since the degree of blindness is in many instances related to the etiological factor responsible for the blindness, the relationship between that factor and emotional adjustment should be determined. Unfortunately those data were not sufficiently complete to be included in this study. This problem is, however, now under investigation.

The fact that all of the pupils who had been dropped from the rolls for discipline problems had scored 35 points or higher on the *Personal Index* indicates that this device is valuable for use by the officers of the school in locating potential problems. The above finding was further substantiated when the behavior records of the forty-six pupils with scores above 45 were examined, since approximately two-thirds of this group were problems in school or in dormitory. Also, only four of the twenty-seven pupils who scored below 30 points were considered problem children.

The fact that the behavior ratings were made several years, on the average, after the *Personal Index* score was obtained makes these data even more significant. These ratings were not made as a result of only a few observations over a short period of time. Also, new forces may have operated in changing the adjustment of those four individuals who were classified as behavior problems. Their *Personal Index* scores, if they had been obtained shortly before the rating, might have been different from the ones used in this study. This problem of the constancy of the *Personal Index* score is worthy of further consideration and is now being investigated by the writer.

It is neither expected nor claimed that all cases of maladjustment will be located by the device used in this study, or by any similar device. For example, one partially-sighted boy, fourteen years of age, superior in intelligence, in the seventh grade made a comparatively low score of 22 indicating no serious emotional disturbances. However, it was evident that he was definitely in need of assistance. He had withdrawn so far from reality that at times during free periods in the yard he could be observed talking to himself and smiling. He would suddenly run to a bush, pick a leaf, and burst into laughter. He had found a solution to his worries through a mental withdrawal from the immediate environment. Consequently, his test score was low.

Let us consider those pupils who made high scores, but were not considered behavior problems by their supervisors and teachers. It is the opinion of the writer that one of the main functions of any test of this nature is the location of these cases. For example, one boy who made a score of 52 was rated by the teachers as one of the best-adjusted boys in the school. Several conferences with him revealed that he was troubled by his progressive loss of sight and that the future seemed hopeless to him. A program involving extra-curricular activities as well as academic subjects was planned with him. Through the successful participation in a number of activities, he has developed socially and has gained in self-confidence. Without the indication given by the *Personal Index* score, he would have received less help from the administration of the school, and his development would have been left to chance. It is the quiet pupil who is in reality a behavior problem subject who must be identified early and who must receive special attention.

SUMMARY

The *Personal Index* was administered to all the boys (sixty-two) and all the girls (sixty-six), twelve years of age or older, attending a school for the blind between the fall of 1939 and the spring of 1943.

The percentages of the boys and girls in this sample who exhibited a high degree of personal and social maladjustment were considerably higher than those found for boys in city school systems, but not as high as those reported for boys in a state reform school.

There was no significant difference between the boys and the girls in terms of either mean score (critical ratio = .1) or variability (critical ratio = .8).

Maladjustment was found to correlate inversely with intelligence ($r = -.29 \pm .06$) and directly with the number of years during which the visual handicap had been recognized ($r = .25 \pm .06$). The correlations of years retarded, grade, years in this school for the blind, and chronological age with the *Personal Index* score were all less than three times their probable error.

The sight-saving pupils in this sample made higher scores (maladjustment) than did the partially-sighted pupils, who in turn indicated more personal and social problems than did the totally-blind children.

An analysis of the behavior records of the children revealed that all fifteen of the boys and girls who had been dropped from the rolls of the school because of discipline problems had scored 35 or higher, a score which the authors of the test stated might deserve attention.

When the behavior records of the forty-six boys and girls who had scored above 45 were examined, it was found that two-thirds of the group were more or less serious problem children in the dormitories or in the school. On the other hand, only four of the twenty-seven pupils who had scored below 30 points were considered problem children.

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THE USE OF VISUAL AIDS IN SPECIAL TRAINING UNITS IN THE ARMY

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Effective use of visual aids in the classroom promotes learning. Where objectives are clearly defined, subject-matter thoroughly organized, and methods of instruction well adapted to the needs of the group, visual aids serve to facilitate learning. They enable the teacher to motivate his classwork and vitalize his instruction. And they serve to clarify presentations and hence to improve communication.

Although the use of visual aids does not insure good classroom teaching, it does encourage rapid and thorough assimilation of subject-matter. It follows therefore that superior instructors generally secure access to varied and appropriate visual aids and use them judiciously.

Effective visual aids have the following characteristics: a) They are prepared to elucidate, emphasize, or demonstrate specific points or facts; b) They are appropriate to the material being presented; c) They are interesting, clear, and legible; d) They are of suitable size for the class; e) They are easy to manipulate; and f) They are generally inexpensive and durable.

This paper will describe the various types of visual aids which are used to help illiterate, non-English speaking, and educationally retarded men in the Army become useful soldiers. To orient the reader a brief summary will be given of the nature and objectives of the Army's Special Training Units—the organizations to which these men are sent.

PROGRAM OF INSTRUCTION IN SPECIAL TRAINING UNITS

Illiterate, non-English speaking, and educationally retarded men are not ready, when they enter the Army, to pursue regular basic military training. Accordingly, they are sent to Special Training Units. Assignment to a Special Training Unit takes place immediately after these men pass through the Reception Center, where they receive clothing and equipment, initial inoculations, preliminary classification interviews, and essential orientation in Army customs and regulations.

In a Special Training Unit, the trainees undergo academic and military training which helps them develop sufficient literacy skill, arithmetic ability and orientation in military areas to be able to proceed with regular basic military training. The length of the training period in the Special Training Unit averages eight weeks; eighteen hours a week are given to academic instruction and thirty hours to military training. Since training is adapted to the individual needs of the men, it is possible for a man to leave the unit as soon as he attains indicated standards in reading, arithmetic, and military subjects. The training cycle is planned not to exceed twelve weeks, although an occasional man is permitted to remain sixteen weeks. Men found inept are honorably discharged from the service.

To aid in the accomplishment of its mission, it has been necessary for the Special Training Section, Military Training Division, Army Service Forces Headquarters,[1] to devise its own materials. The *Army Reader*, *Army Arithmetic*, weekly and monthly publications, and guides for the instructors and men have been developed. An effort has been made to construct materials which utilize sound educational principles to attain the objectives of special training. A more complete statement on the program of Special Training Units has been presented elsewhere.[2]

TYPES OF VISUAL AIDS AND THEIR USES

It has been stated that the men in Special Training Units receive both academic and military instruction. Instruction in these two areas, however, is related closely. Lessons designed to improve reading skill, use and comprehension of language, and arithmetic ability generally deal with Army problems or needs. Specialized vocabularies are developed for military subjects and appropriate exercises are arranged so that the academic and military presentations are articulated with each other.

In a discussion of the use of visual aids in Special Training Units, it is important to be aware of this correlated teaching

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[1] This was formerly the Development and Special Training Section, Training Branch, Adjutant General's Office.

[2] Paul A. Witty and Samuel Goldberg, "The Army's Training Program for Illiterate, Non-English Speaking, and Educationally Retarded Men," *Elementary English Review*, xx (1943), 306–311.

objective. Similar types of visual aids are appropriate both in the academic and in the military instruction. The illustrations given in the discussion which follows include representative types of visual aids employed.

1) *Textbooks.*—It may appear improper to classify a textbook as a visual aid. But the *Army Reader* can justifiably be so considered because of its rich and varied use of pictures, illustrations, charts, and diagrams. The *Army Reader* uses pictures to teach new words. It presents a series of illustrations to show various activities in which men engage in a day at camp; demonstrates pictorially various squad and marching formations; indicates through diagrams how budgetary accounts may be kept; and enriches the text, in many ways, with attractive, vital, and pertinent drawings. The *Army Arithmetic* uses pictures to show how numerical abstractions are derived from objects; addition is related to counting; subtraction is the reverse of addition; and multiplication is cumulative addition. Monetary concepts are taught through realistic illustrations, and time, through a calendar which is reproduced.

2) *Flash Cards.*—Flash cards are used in teaching words, phrases, and sentences. Some Special Training Units have developed cards which contain pictures in addition to the verbal material. At times, flash cards are used to foster rapid perception; at other times, they serve for review purposes. On occasion, they are used as part of a language game. Words, phrases, and sentences which are taught may be of the type used to bring about improvement in general reading ability. Or, they may be more specialized and related to some military subject. In some Special Training Units, students are provided with small self-teaching cards, in which the word, phrase, or sentence is associated with a picture.

3) *Spinner.*—An arrow spinner made out of wood or heavy cardboard is attached to a circular board about three feet in diameter. Words or number combinations are pasted on the outside of the circular disc, or word cards with arithmetic combinations are inserted in pockets pasted on the disc. The spinner has been used to teach word and number recognition and to give practice in computation. Since this visual aid introduces an element of chance, it has served as an interesting motivational device in some units. Variations of the spinner

device, such as a word and number wheel, have also been used in introducing instruction in the beginning phases of reading or arithmetic.

4) *Training Films.*—Training films are a regular part of military instruction. The men in Special Training Units are shown various motion pictures. Some of these are on orientation, personel hygiene, organization of the Army; and others deal with military courtesy and discipline and similar topics. A number of training films are shown at the Reception Center before the men come to Special Training Units. Others are used at different periods throughout training.

Illiterate, non-English speaking, and educationally retarded men probably experience some difficulty with films shown to them at the Reception Centers and in the early stages of training. Dialogue for films, generally written at a relatively high level, is too difficult for men in Special Training Units. And, the action in many motion pictures proceeds at too rapid a pace. Accordingly, a number of film strips have been prepared to insure the assimilation of essential knowledge by men in Special Training Units.

5) *Film Strips and Illustrated Instructor's References.*—A film strip is a continuous series of still pictures, charts, or diagrams. It is prepared on 35 mm safety film. The film strip projector is small and compact. The speed of projection of a film strip is controlled by the instructor or his assistant. Any frame in a strip can be held on the screen until the majority of the group has mastered it and is ready to go on to the next one.

The following film strips have been developed to meet the needs of men in Special Training Units: *A Soldier's General Orders; Military Courtesy and Discipline; How to Wear Your Uniform; The Story of Private Pete*, a reading film strip to teach a basic stock of sight words; *Introduction to Numbers*, for the teaching of basic vocabulary, symbols, and group concepts in beginning arithmetic; *Introduction to Language*, two film strips, one for the teaching of nouns and the other for verbs and prepositions; and *The World*, for the teaching of geographic vocabulary and concepts.

Each film strip is well motivated. In some film strips situations which the soldier has encountered in his civilian experiences are associated with the materials of the strip. For example, in

introducing *How to Wear Your Uniform*, several beginning frames are given over to the presentation of men in uniform, i.e. policemen, firemen, football players. Or, in presenting *Military Courtesy and Discipline*, introductory frames deal with tipping your hat to ladies, helping your neighbor fix his car, and giving your seat in a car to a lady. In others, the motivating frames relate to various Army situations in which the soldiers will have need for the type of material to be presented in that particular film strip.

Each film strip is logically organized to meet the needs and interests of the men. Effort has been made to fulfill psychological pre-requisites which are fundamental in the teaching of illiterate, non-English speaking, and slow-learning men. The level of language used is relatively simple. Frames are not cluttered with too much detail or material. Opportunity exists for necessary repetition of certain basic material. Review frames are included. And, correlation of military and academic subject-matter is achieved through the use of appropriate content.

Of great value to the teacher is an *Illustrated Instructor's Reference* which has been written to accompany each of the film strips. The *Reference* states the purpose of the strip; indicates general teaching methods for the type of material being presented; and contains specific suggestions for teaching each frame. The picture in each frame is reproduced in the *Reference*. This makes it easy for the instructor to pre-view each film strip while preparing his lesson.

The use of film strips and the *Illustrated Instructor's References* has become an important regular part of instruction in Special Training Units.

6) *Pictures.*—Pictures have been used in a variety of ways. Graphic portfolios are available for instruction in some military subjects, i.e. defense against chemical attack, scouting and patrolling, etc. In these portfolios, pictures are used to illustrate such points as the effects of different gases if the enemy ever uses them, and methods of making adequate uses of terrain in scouting. Other pictures which are not part of a particular portfolio are also used to teach military material. For example, different types of planes and tanks are best described through the use of carefully selected photographs.

Our War, a monthly magazine prepared especially for men in Special Training Units, makes extensive use of pictures. This publication is of great value in the reading program and the pictures help the men to visualize the material more effectively. Picture pages appear as a regular feature of this magazine. In recent issues there have been picture pages on the following subjects: Army Christmas; How Airplanes are Made; Weapons in the Making; Chemical Warfare Weapons; and Women in the War.

Other publications, designed especially for Special Training Units, also use pictures. *Newsmap-Special Edition*, a weekly publication which presents the news of the war on all fronts, is richly illustrated with pictures and maps. *Your Job in the Army*, a pamphlet which contains simple accounts of Army jobs for which Special Training Unit men are well adapted, includes pictures and sketches to portray the nature of work to be performed in each job.

Instructors make varied and wide use of bulletin boards in the classroom. These bulletin boards contain pictures, charts, maps, and other materials. These materials are varied from time to time. It is not uncommon in a classroom in a Special Training Unit to see pictures on the bulletin board of timely, current activities of interest to the men, i.e. outstanding generals, prominent athletes and actors in uniform, and camp cccurrences.

7) *Posters.*—Some organizations have developed posters which contain representations of insignia, both for grade and branch of service. These help to orient the men concerning Army organization and personnel. Directional posters and signs have been used to help the men in becoming adjusted to the camp and its environs.

One unit has started an interesting series of posters to illustrate talks given by the Chaplain. Another unit has made posters to teach the men the importance of safeguarding military information.

8) *Cartoons.*—The men in Special Training Units are attracted to cartoon strips as are most other adults. *Our War* contains a cartoon strip as one of its regular features. This strip tells of the experiences of Private Pete and his friend, Daffy. Recent issues have carried the following cartoon strips: Christmas in Camp, Pete Goes Home, Marksman Pete, Pete Meets Gas, and

Private Pete Gets a Letter. The cartoon strip has the same characteristics that other material has which is prepared for Special Training Units. The content is realistically associated with the men's experiences, and the level of difficulty of the language does not exceed the fourth grade. Humorous elements are used in the strips to heighten their appeal to the men. But, effort is put forth to make certain that the men will gain some basic information or knowledge from every strip.

The cartoon technique has been employed in other ways. For example, one Special Training Unit has developed a set of posters which presents figures in caricature to teach the men to identify various gases and agents used in Chemical Warfare. This is a particularly effective device as it serves to attract attention, elicit interest, and foster learning.

9) *Maps.*—In the *Newsmap-Special Edition,* maps are employed to help the men locate the various fronts on which military action is taking place and about which they are reading. In *Our War,* maps are similarly used to aid in developing the men's reading abilities. However, they are also constructed to include some measurement concepts. In a recent issue, the map page in *Our War* dealt with "Neighbors Around the World." A polaroid type of map was used to portray distances by air from certain points across the North Pole. At the bottom of the map were pictures of a Fiji Islander, a Chinaman, an Eskimo, a Russian, an Indian, and a Brazilian. In the accompanying text, questions such as these appeared for the men to answer: "Which man lives nearest to us?", and "Which man lives farthest away?" Two other recent issues contained maps of Canada and Mexico, the accompanying stories entitled, "Our Good Northern Neighbor" and "A Good Southern Neighbor." These maps were a pictorialized type showing where the farm land, minerals, forests, and furs were in Canada and where in Mexico the minerals, cattle, rubber plants, coffee, and bananas might be found. The men were provided with questions such as these to check their comprehension and retention of the material: "Which product covers most of the land in Canada?", "Name three products that Canada ships to England," "In what part of Mexico are cattle raised?", and "What product is grown near Mexico City?" Geographic orientation which Special Training Unit men obtain from the use of maps helps

them to understand better such phases of the war effort of the Americas as relate to the production and delivery of food and supplies.

Men in Special Training Units do not have extensive experience in military map reading of the sort that relates to surrounding terrain. Yet, in such subjects as scouting and patrolling and in preparing for marches and bivouacs, simple maps are used. *The Soldier's Handbook* contains such illustrative maps; for example, a scout observing landscape position, from a place of concealment, for signs of hostile occupation.

Maps serve as an indispensable training aid for men in Special Training Units. They help to advance both the academic and military preparation of the men.

10) *Diagrams and Charts.*—Appropriate diagrams and charts are of great value in teaching important military and academic material. In teaching the names and functions of parts of the rifle, it is generally helpful to have a diagram of the rifle on a chart with the parts properly designated. Diagrammatic presentations make it much easier to teach the formations and steps of a squad or platoon in marching. Many units have used diagrams of gas masks to show the face plate, hose, carrier, and canister, and to demonstrate how the mask works. Appropriate diagrams and charts insure clarity and understanding.

11) *Actual Objects and Models.*—Whenever feasible, actual objects are introduced. Even before the men use guns and gas masks to develop certain performance skills, they have an opportunity to examine and handle gas masks and guns. In presenting some types of material, a number of units have developed appropriate models for instructional purposes. In the subject, Defense Against Air Attack, it is necessary for the men to learn to identify the more prominent American and enemy planes. One unit made a set of models of prominent American planes to illustrate the relationships of wings, engines, fuselages, and tails. In regular training units, models of tanks, mortars, and other weapons have been used to aid the men to visualize and understand their structure and functioning characteristics.

12) *Sand Tables and Topographic Models.*—Sand tables and topographic models have also been used with relatively small groups of trainees to provide an overall view of an area. Terrain

can be represented realistically with this type of aid. Valleys, streams, elevations, and roads are shown clearly; and buildings and different types of military equipment can be placed appropriately. Sand, water, clay, plasticene, sponge, paper, cardboard, wood, and toy equipment—all have been used to prepare topographic models. Aids of this type have promoted the rapid assimilation of principles of camouflage and dispersion in defense against air attack.

SUMMARY

A brief description has been given of the various types of visual aids which have been employed by Special Training Units in the Army. Of course, the use of these training aids is not limited to Special Training Units. All training programs in the Army have made extensive use of such aids and devices.

No single type of visual aid is recommended for a particular period of instruction in a Special Training Unit. Instructors can select the types of aids with which they are most familiar and which seem most suitable for a particular purpose. To help instructors, most Special Training Units have organized a Training Aids Section which prepares and distributes training aids.

Army training, whether basic, technical, or specialist, is organized realistically. Instructors have their objectives clearly in mind. They know the skills that their men need to develop to meet certain field and battle situations. And they know the teaching methods by which different types of materials can be most effectively learned. An indispensable adjunct to effective methodology is the visual training aid. It has already demonstrated its value in a training program which must secure the maximum results within a minimum time limit.

COÖPERATIVE VERSUS INDIVIDUAL EFFICIENCY IN PROBLEM-SOLVING[1]

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A. INTRODUCTION

Coöperation has been defined by many writers[6,7,11,16] as a kind of group competition or rivalry. Others[15,18,21,27] interpret it as social facilitation in which individuals are stimulated to do better work simply because of the presence of other workers. Still others[3,4,8,9,13,14,20,24] have thought of coöperation as pooled independent judgment, although Preston[20] (p. 471) speaks of "judgments which are a consequence of the interaction of viewpoints."

A definition of coöperation as employed in this paper has been stated briefly but effectively by Katz[12], (p. 119): "Coöperation . . . describes a joint coördinated effort by two or more individuals." Folsom[5] and Warren[26] hold to a similar point of view.

A number of studies exist which are concerned with the matter of coöperation as defined in this paper[1,22,23,25,27]. It might be stated, in passing, that perhaps it would be advisable, to avoid confusion, to make use of a word other than 'coöperation.' If so, this writer wishes to suggest the term 'complementation' as a possibility, since the members of a group are complementing each other's efforts.

Several investigators[2,10,17,19,22,29] have sought to explain, on the basis of experimental data, the reasons for the improved results which seem to favor coöperative behavior over individual efficiency.

B. PURPOSE

The purpose of this study was to determine whether, among children of average intelligence (IQ 90 to 109), two heads were better than one in the solution of twenty arithmetical problems graduated in difficulty; i.e., whether two children, working together, could do more problems correctly and in a shorter

[1] Presented at the 1943 meeting of the Eastern Psychological Association, Hunters College, New York.

[2] The writer is grateful to Professor Miles Murphy for his suggestion of, and continued interest in, this problem.

time than each child working alone. In order to overcome the matter of differences in speed of reading, all children were asked to complete all problems.

C. PROCEDURE

The Subjects.—In all there were one hundred thirty-six school children who took part in the experiment. They ranged in age from 108 to 155 months with a mean of 128.5 months. They were in Grades IV, V, and VI. There were seventy-two female and sixty-four male children. Seventy-six were white and sixty were Negro children.

Equating the Pairs.—The children were equated for sex, race, grade, age (within three months), and IQ (within four points).

The Test.—The children were required to take two forms—A and B—of the Otis Arithmetic Reasoning Test. The test is made up of twenty arithmetic problems graduated in difficulty and the directions call for a time limit of six minutes. However, as stated above, in this experiment a work limit plan was used in order to overcome the differences in speed of reading.

Order of Testing.—After the children in each classroom had been paired, the first pair was designated as I-P, the second as P-I, the third as I-P, etc. I-P means that the pair was to be tested individually with Form A, then paired on the following day at the same time and tested with Form B. P-I refers to paired testing with Form A followed by individual testing the next day with Form B. This procedure, of course, resulted in the elimination of any practice effect which would have occurred had all the children been tested as I-P or P-I.

Directions.—

To paired children

"Here is a test of arithmetic problems for each of you. You two are to work together in order to get the correct answers. That is, you are to talk over each problem until you feel that you have the correct answer. However, you must not waste time for you are to finish as soon as possible. You are to try every problem and I want an answer even if you have to guess. Write in the answers on only one test paper and when you finish you will return to me one paper with answers to all the problems and a clean paper with no answers on it. Now find the place

on the test where it says, 'Sample Problem.' Listen while I read it." (When children indicated that they knew how to solve the problems, they were asked to turn over the forms and begin. They were timed with a stop-watch.)

To individual children

"Here is a test of arithmetic problems. You are to find the answer to every problem and I want an answer even if you have to guess. Do not waste time for you are to finish as soon as possible. Now find the place on the test where it says, 'Sample Problem.' Listen while I read it." (When child indicated that he knew now to solve the problems, he was asked to turn over the forms and begin. He was timed with a stop-watch.)

Scoring.—When tests were scored for number of problems, the raw scores were used. The time was taken from the moment the children were asked to turn over the papers and begin until the moment the answer to the twentieth problem was put down.

D. RESULTS

Table 1 gives an age and IQ picture of the group as a whole and of the several subgroups. Included are the means, standard deviations, and critical ratios. The mean age for the entire group of one hundred thirty-six was ten years eight and one-half months. The mean IQ for this group was slightly below 100.

TABLE 1.—AGE AND IQ PICTURE OF THE GROUP

	N	*Mean*	*SD*	*CR*
Age	136	128.53[1]	11.30	—
Entire Group	136	99.09[2]	6.23	—
Sex:				
Male	64	98.41	5.90	
Female	72	99.58	6.08	1.14
Grade:				
Four	38	100.47	5.74	
Five	44	99.20	6.20	.89
Six	54	98.00	6.41	.94
Race:				
White	76	99.79	5.99	
Negro	60	98.47	6.48	1.23

[1] Months.
[2] IQ.

The means of the female group and of the white children were about one IQ point higher than the male and colored groups, respectively. Those in Grade IV had a mean IQ which was about one point higher than those in Grade V, while those in the latter grade had a mean which was about one point higher than those in Grade VI. It will be noted, however, that in no instance was there a statistically reliable difference in IQ between the various subgroups.

Table 2 is intended to give a picture of how equally the entire group was divided into I-P and P-I halves. For age, for IQ of the whole group, and for IQ of the various subgroups, no reliable differences were found between the means.

TABLE 2.—AGE AND IQ DISTRIBUTION OF P-I AND I-P GROUPS

	P-I			*I-P*			
	N	*Mean*	*SD*	*N*	*Mean*	*SD*	*CR*
Age	68	128.24[1]	11.23	68	128.90	11.48	.34
Entire Group	68	98.79[2]	6.40	68	99.27	5.80	.46
Sex:							
Male	32	98.06	6.64	32	98.75	5.14	.46
Female	36	99.44	5.90	36	99.72	6.24	.20
Grade:							
Four	20	99.10	5.74	18	101.00	5.34	1.61
Five	22	99.73	6.84	22	98.73	5.44	.54
Six	26	97.92	6.58	28	98.07	5.78	.09
Race:							
White	40	99.05	6.09	36	98.50	5.86	.40
Negro	28	98.50	7.00	32	98.31	5.85	.11

[1] Months.
[2] IQ.

The results of the scores earned by the group as individuals and as members of a pair are presented in Table 3. Two sets of scores are given, one indicating the raw scores and the other the time scores in seconds. It will be seen from the data that the mean P raw score is slightly greater than one problem over the mean I score. That is to say, the entire group of one hundred thirty-six as individuals were each able to get about six problems correct out of the possible twenty. When working in pairs their mean score jumped to about seven. This difference is statistically significant.

When the means of the time scores are compared, it will be noted that the time taken to complete the twenty problems was 184 seconds less for the children when working as individuals than when working as members of a pair. The difference between the two means is a reliable one.

These results indicate, then, that when the children worked in pairs they earned reliably higher scores than when they worked independently. However, while the scores were higher it took them a reliably longer time. This longer time was primarily due to the presentation, discussion, rejection, and acceptance of a greater number of possible answers which occurred when the children worked in pairs.

TABLE 3.—RESULTS OF INDIVIDUAL AND PAIRED SCORES

	N	*Mean*	*SD*	*CR*
I Scores	136	6.18[1]	2.49	
				3.51
P Scores	136	7.29	2.77	
I Time Scores	136	1054[2]	373	
				3.61
P Time Scores	136	1238	462	

[1] Raw scores.
[2] Seconds.

Table 3 gives the results for raw scores and time scores for the entire group without indicating what effects pairing had upon the several subgroups. To supply these data, Table 4 was constructed to show the results for the raw scores and Table 5 was made to show the results for the time scores for the various subgroups. Each of these tables presents not only the subgroups as regards grade, race, and sex, but also upper- and lower-average intelligence groups and younger and older children.

A study of Table 4 reveals that in every instance and for every subgroup the mean P score is higher than the mean I score. In several instances, the differences are reliably significant; namely, for the children in Grade VI, for the white children, and for both the girls and boys. We may be fairly certain that the Negro children, those who are of upper- and lower-average intelligence (as measured by IQ scores), and both the younger and older pupils earned truly higher scores when paired than when working alone. For the children in Grades IV and V the critical ratio may be said to indicate a tendency in that direction.

Table 5 indicates that in every instance and for every subgroup the time scores for the P tests are greater than those time scores for the I tests. We may be reasonably certain that the differences are reliably significant for those in Grade VI, for the colored children, for the girls, for those in the lower-average group, and

TABLE 4.—RELIABILITY OF THE DIFFERENCE BETWEEN INDIVIDUAL AND PAIRED RAW SCORES FOR THE VARIOUS SUB-GROUPS

	I Scores			*P Scores*		
	N	*Mean*	*SD*	*Mean*	*SD*	*CR*
Grade IV	38	4.53	1.74	5.26	2.04	1.69
V	44	5.45	2.56	6.41	2.64	1.72
VI	54	6.67	2.49	8.19	2.59	3.10
White	76	5.97	2.32	7.18	2.51	3.09
Negro	60	5.13	2.52	6.30	2.99	2.31
Male	64	6.14	2.62	7.74	2.67	3.42
Female	72	5.21	2.30	6.30	2.62	4.01
Lower Average[1]	76	5.20	2.17	6.17	2.60	2.51
Upper Average[2]	60	6.26	2.77	7.39	2.87	2.19
Younger[3]	76	5.36	2.40	6.33	2.81	2.42
Older[4]	60	6.42	2.43	7.64	2.50	2.47

[1] 90–99 IQ.
[2] 100–109 IQ.
[3] Nine- and ten-year-olds.
[4] Eleven- and twelve-year-olds.

for the older individuals. We may be fairly certain of the reliability of the difference in the case of children in Grade V. A tendency may be said to exist in this direction among the white, the male, the upper-average intelligence, and the younger children. In the case of children in Grade IV, no difference existed.

The results have shown, thus far, that, when paired, children earned reliably higher scores and took a significantly longer time. Now it is entirely conceivable that the following situation may have arisen: Let us assume that of six children, five earned exactly the same score when paired as when working individually. The

TABLE 5.—RELIABILITY OF THE DIFFERENCE BETWEEN INDIVIDUAL AND PAIRED TIME SCORES FOR THE VARIOUS SUB-GROUPS

	I Scores			*P Scores*		
	N	*Mean*	*SD*	*Mean*	*SD*	*CR*
Grade IV	38	1189	483	1221	556	.27
V	44	1050	294	1262	416	2.78
VI	54	935	295	1230	421	4.21
White	76	1116	412	1216	472	1.39
Negro	60	983	308	1283	438	4.39
Male	64	1019	388	1156	422	1.91
Female	72	1072	366	1311	502	3.26
Lower Average[1]	76	1026	378	1284	478	3.69
Upper Average[2]	60	1077	376	1193	422	1.59
Younger[3]	76	1140	430	1224	455	1.35
Older[4]	60	920	288	1277	458	5.11

[1] 90–99 IQ.
[2] 100–109 IQ.
[3] Nine- and ten-year-olds.
[4] Eleven- and twelve-year-olds.

sixth child may have improved his score by six points. The average improvement for this group would indicate a gain of one problem as a result of pairing. Such a conclusion is rather a spurious one for, as a matter of fact, pairing improved only one subject's score while it did not affect that of the other five. Accordingly, a table (6) has been worked out to determine whether such a condition existed in this study.

Table 6 shows that not every subject improved his raw score and spent a longer time on the problems when paired. Over fifteen per cent obtained similar raw scores when paired as when working independently. Twenty-two per cent earned lower raw scores when paired. For the time scores, the table shows that thirty-six per cent took less time when paired than when working alone. When the critical ratio was determined between the percentage which earned higher raw scores and the combination of percentages for the same and lower raw scores (i.e., 37.5 per cent)

TABLE 6.—RELIABILITY OF THE DIFFERENCE BETWEEN THE PERCENTAGE EARNING HIGHER RAW AND TIME SCORES AND LOWER RAW AND TIME SCORES

	Raw Scores			Time Scores		
	N	*Per Cent*	*CR*	*N*	*Per Cent*	*CR*
Higher Score	85	62.50		87	63.97	
Same Score	21	15.44	2.95	...	.....	3.23
Lower Score	30	22.06		49	36.03	
Total	136	100.00		136	100.00	

it was found to be 2.95. Similarly, when the critical ratio was obtained between the percentage of children who took a longer time when paired and the percentage who took less time, it was found to be 3.23.

These results indicate, then, that not only was there a reliable difference between scores, but that there also existed a significant difference between percentages of subjects obtaining higher raw and time scores and those getting the same and lower scores (those who showed no increase).

E. SUMMARY AND CONCLUSIONS

The purpose of the study was to determine whether, among children of average intelligence (IQ 90 to 109), two heads were better than one in the solution of twenty arithmetical problems graduated in difficulty; i.e., whether two children, working together, could do more problems correctly and in a shorter time

than each child working alone. In order to overcome the matter of differences in speed of reading, all children were asked to complete all problems.

The results indicated that children working together solved more problems correctly but took a longer time. The differences were statistically significant. This is true whether we think in terms of scores or percentages of cases. In addition, for the subgroups, the results of the raw scores showed with reasonable certainty that the sixth-grade children, the white children, and both sexes earned truly higher scores when working in pairs than when working independently. Mean time scores for all subgroups were higher for problem-solving when the children were paired than when working alone. The time scores for Negro, sixth-graders, female, lower-average intelligence, and older children were reliably longer.

The higher raw scores for the paired children and the longer time needed to solve the problems were both due to the presentation, discussion, rejection, and acceptance of a larger number of possible answers which occurred when the children were working together than when working independently.

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THE RELATIONSHIP BETWEEN FUNCTIONAL AND VERBALIZED MOTIVES

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It is often said that there are good reasons and real reasons for our behavior. Thoughtful observation of human behavior suggests that the verbalized explanation one makes of one's behavior may have something less than a direct relationship to the deep-seated motives which actually direct activity, and which may operate at a subliminal level. This report describes an attempt to obtain objective data on that relationship.

The individual's basic value concepts have recently been rather widely acknowledged as the frame of reference from which his behavior (including his attitudes) obtains its general direction and tone. Studies of personal values have shown that such a position is sound, and that by means of an indirect test[1] it is possible to obtain for an individual a pattern of functional values arranged in the order of their relative importance to the individual. One's verbalized value pattern may then be obtained by simply asking one to rank the same values contained in the indirect test.

The problem is, how will one's verbalized statement of one's basic values compare to one's real values as determined by an indirect and functional test, and will the relationship of the values in the two lists change with maturity? The "Study of Choices"[2] was used as the indirect test, and a simple list of the twelve values contained in the test was used to obtain the verbalized statement of values from each subject. In this discussion a person's values are considered to be his conscious or unconscious evaluation of any of a given list of basic states or conditions of life, such as having wealth, political power, excitement, living in comfort, maintaining personal improvement, and others. A relative rank order is obtained rather than an absolute rating, so the test yields a pattern of values ranging from the one with the highest appeal, through a neutral area to the one which is most

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[1] Asahel D. Woodruff, "Personal Values and the Direction of Behavior," *School Review*, 50, Jan., 1942, 32–42.

[2] Ibid.

objectionable to the individual. Close comparisons are possible between the verbalized and the indirect list of values because each testing instrument arbitrarily contains the same twelve items.

Three groups of subjects were used in the study: (a) fifty-four undergraduate students preparing to teach and in their first course in educational psychology, (b) ten college instructors, and (c) eleven full professors, all at Cornell University. Each of the subjects filled out the verbalized list of values first by simply rearranging the group of twelve values into the order of personal preference. Previous use of these lists shows the reliability on repeated ratings at least three weeks apart to be .97 for the whole group when all individuals are thrown into one group pattern, or to range from .57 to .99 (when rho is determined for every individual by comparing his two lists by the rank order correlation method), with the median rho at .89. Only five of the fifty-four individuals whose performance was checked had a coefficient below .75, and half of them were at or above .90.

Following the verbalized test each subject completed the functional test of values. It, too, has been recently checked for reliability. Two administrations three months apart to forty-five college students yielded a reliability coefficient of 1.00 for the whole group as determined by a rank order correlation of the two patterns thus obtained. When correlations between the two trials were computed for each student individually, they ranged from .46 to .99 with a median of .895. In nine groups of only five students each, grouped alphabetically, the coefficients were .98, .98, .97, .97, .97, .94, .93, .92, and .88.

For the students, the functional pattern of values (Form I of the test) is, from high to low, Home life, Friendship, Social service, Personal improvement, Security, Comfort, Religion, Intellectual activity, Society, Excitement, Political power, and Wealth. Their verbalized pattern (Form III of the test) is, Home life, Friendship, Security, Personal improvement, Religion, Comfort, Intellectual activity, Social service, Excitement, Society, Wealth and Political power.

The functional pattern for the instructors is Home life, Social service, Intellectual activity, Friendship, Personal improvement, Security, Comfort, Religion, Wealth, Excitement, Political power, and Society. Their verbalized pattern is, Home life, Security, Friendship, Personal improvement, Intellectual activity,

Social service, Comfort, Religion, Wealth, Society, Excitement and Political power.

The functional pattern for the professors is, Social service, Intellectual activity, Home life, Friendship, Comfort, Security, Personal improvement, Political power, Religion, Wealth, Society, and Excitement. Their verbalized pattern is Home life, Intellectual activity, Friendship, Social service, Personal improvement, Security, Religion, Comfort, Society, Wealth, Political power, and Excitement. When these various patterns are compared six interesting findings emerge.

1) There are distinct and significant differences between the verbalized and the functional values within each group. When the rank correlation between Forms I and III was obtained for all individuals, it was found that the median coefficient for all students was .66; for all instructors, .60; and for all professors, .72. These correlations indicate the amount of gross disagreement between the two forms, but do not define the nature of that disagreement. The significant differences between the two lists are confined to a few of the values; the values which show such differences are largely the same ones for each group; and there is consistency in the differences, both within each group and from group to group. For example, Security is always higher in Form III than in Form I, which means that in all three groups there is a tendency to rate it verbally at a higher level than its true functional level. Similarly, Social service is rated lower than its functional level, and by all three groups. The relationship of the three groups as to over- or underrating is shown in Figure 1 where the actual difference between the mean positions of each value in both lists is shown for all values and all groups. In the figure it may be seen that Security, Friendship, and Religion are rated above their functional level by all three groups; that Comfort, Political power, and Social service are rated at or below their functional level by all three groups; and that Intellectual activity, Wealth, Excitement, Home life, Society, and Personal improvement are underrated by one or two groups and overrated by one or two. Social psychologists should be interested in explaining why these subjects uniformly overrated or underrated such values as Religion and Political power, which are so deeply imbedded in American culture.

The statistical significance of the differences between the positions of the values in Form I and those in Form III can be evaluated in the student group where N = 54. The probable errors are small and five of the critical ratios (those for Security, Intellectual activity, Social service, Wealth, and Political power)

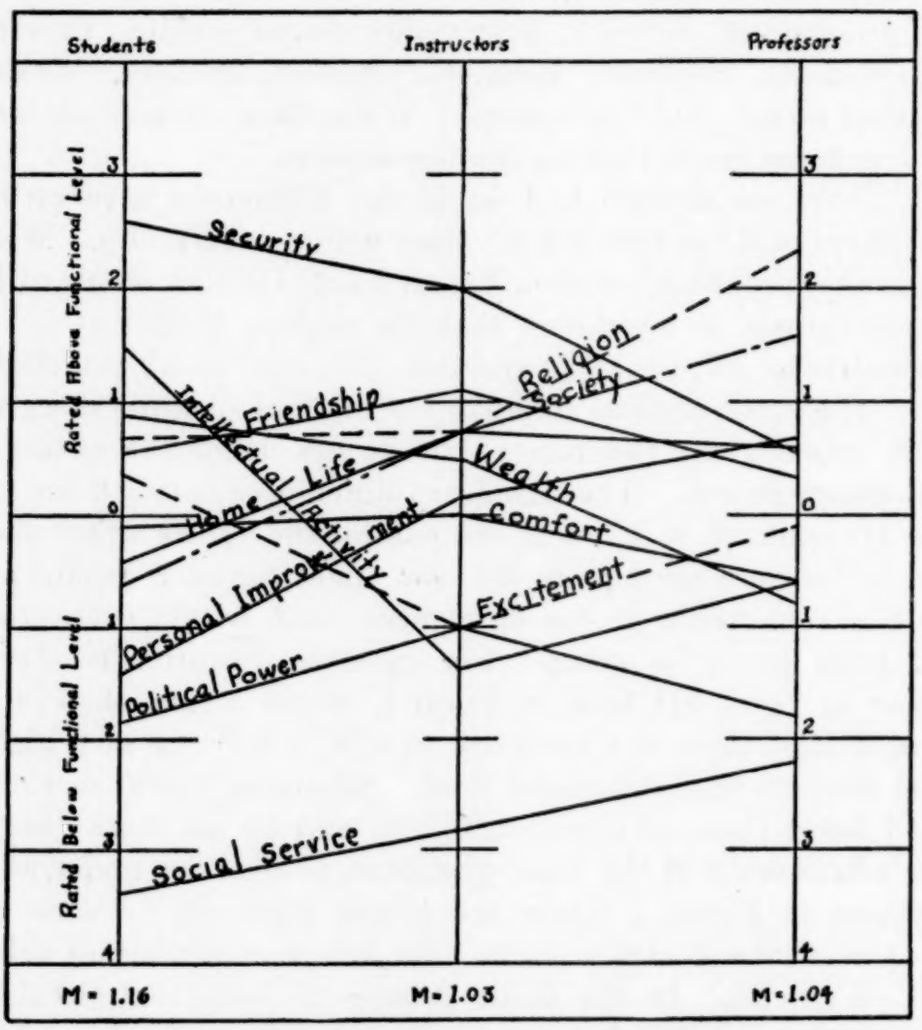

FIG. 1.—Relationship between functional and verbal ratings, showing differences between mean positions of each value in both lists.

are high enough to be significant. In the other two groups N is too small to obtain critical ratios of a significant size, but the differences between values are practically as large as for the students. A careful examination of the distribution in each group for each value suggests that the absence of high critical ratios is probably due mainly to the small size of N, and not to a lack of representativeness in the sample.

2) There is a slight and insignificant tendency in these data for more mature persons to show a greater degree of similarity between the verbalized and the functional values than do less mature persons. There is revealed in Figure 1 a slight tendency for the lines to draw in toward the zero point as they progress from students to professors. When the differences between mean positions of each value in both lists were added together, and averaged, it was found that the average difference for students was 1.16; for instructors, 1.03; and for professors, 1.04. These figures do not differ significantly. If such data are found in other similar studies, they suggest that we do not develop an increasing over-all reality in our rational processes as we grow older, or that such a development is so slight as to have no significance, or that it is confined to a small per cent of the population.

3) There is no uniform pattern of differences for all the values. These variations were found: (a) For some values there is close agreement in all groups between verbalized and indirect ratings, and for other values there is such agreement in only one or two of the three groups. (b) Some values show a diminishing discrepancy between verbalized and indirect ratings with maturity. (c) For some values the direction of the discrepancy is reversed with maturity; that is, a value overrated by students is underrated by mature people, and in some cases this progression is quite regular through the three groups. (d) For some values the variations show no relation whatever to maturity. (e) The nature of the value itself seems to be an important factor in determining its own variation.

4) Some values crucial in American cultural traits and also in personal relations show uniform differences in all three groups. Examples are Political power and Social service, which are rated below their functional levels, and Friendship and Religion, which are rated above their functional levels.

5) Comparisons between value patterns of the three groups show some differences which are statistically significant, and some similarities. When the groups are compared with Form III, the rank correlation between students and instructors is .90; between instructors and professors, .87; and between students and professors, .75. There are no statistically significant differences between students and instructors; between instructors and

professors there are significant differences for Security and Intellectual activity, since professors claim to be less interested in Security and more interested in Intellectual activity than instructors; and between students and professors there are significant differences where professors claim to be less interested in Security and Excitement, but more interested in Intellectual activity and Social service than the students.

While there is probably less connection between the evaluations on Form III and daily behavior than for the evaluations on Form I and daily behavior, it is nevertheless helpful in dealing with people to know their verbalized evaluations as well as their more basic values. When comparisons are made between the groups on Form I, those basic value differences may be found. Between students and instructors there are these significant differences: Instructors care more for Intellectual activity and Wealth, and less for Friendship and Society than students. There are no significant differences between instructors and professors, but between students and professors there are these significant differences: Professors care more for Intellectual activity and Wealth, and less for Personal improvement, Religion, Society, and Excitement than students. It is clear that maturity is a factor which produces changes in one's value pattern, even though such changes may not involve an increasing realism in one's verbalized recognition of those values. It would also seem that both value patterns, the verbalized and the functional, are in an active condition of change, through reaction with experience, but that the values in them do not necessarily change in the same direction in both patterns.

6) Those interested in the development and maturation of young people will want to know how time and experience deal with one's basic motives. An examination of the changes in patterns through the three groups may offer some useful tentative hypotheses. There are apparently four kinds of changes taking place with age in the relationship of the two value patterns in these data. (a) The verbalized evaluation remains the same while the value drops in the functional pattern. An example is Personal improvement. It may be that as a group we do not give up our lip-service to the need for personal growth, but with age we tend to become more self-satisfied or else more easily satisfied, and hence less energetic in seeking such growth. (b)

The functional pattern remains approximately constant, and the verbalized evaluation changes with age. An example is Security. Functionally, it is no more possible for an adult to court insecurity than for a young person, but it is quite likely that with age, most college professors find security without the need of seeking it, and their awareness of a need for it lessens. (c) The functional value moves steadily in one direction, and the verbalized value follows but is slower at first, and comes along faster later. An example is Intellectual activity. Its upward movement in the functional list may be in part a matter of selection, since the older groups are college teachers and, therefore, presumed to be more interested in intellectual activity than some others might be. That does not, however, explain the change in the verbalized list. This may be a reflection of the influence of the 'ivory tower' atmosphere which tends to emphasize mental activity at the expense of practical applications of theory. (d) The value in the verbalized list and the same one in the functional list move gradually in opposite directions. An example is Society, which becomes slightly less important functionally, and slightly more important verbally.

These observations suggest a possible explanation of another commonly observed phenomenon in human motivation. One's evaluation of any basic life condition is popularly said to fluctuate in relation to the circumstances. For example, we do not value security highly until we become insecure. It may be more correct to say that the functional value of security does not fluctuate, but that the verbalized value does. Hence one's basic and functional motives do not change rapidly, but the degree of awareness of what those basic values are may be greatly influenced by immediate experiences when such values are seriously involved.

It is quite possible that the relationships indicated in these data may not be typical of any groups with different backgrounds or in different settings. What one finally comes to cherish in life is so intimately derived from one's unique experiences, that these tentative findings need not only verification through studies with similar groups, but comparison with findings of similar studies in many different kinds of groups. The technique used in this study seems to offer a valid and reliable means for such investigations.

THE 'ANDOVER' SCHOOL-ENTRANCE TEST

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The 'Andover' test consists of twenty-five orally presented questions carefully scaled to the five to six-year mental level. Although individually presented, it is essentially a group test in the sense that it is used for dividing a group of children into two sub-groups. It does not yield an individual rating by an absolute standard, but is useful when a relative rating will serve the desired end. It is not recommended for the use of the psychologist to whom a child is brought by his parents for individual certification of his readiness for school instruction; but is intended specifically for the school-conducted examination which is open to all children of a limited age-range. The presentation is uniform for all the children of a given group, and the scoring is objective.

These twenty-five questions have been selected on an empirical basis from one hundred eight questions used in earlier examinations. In approximately its present form, the test was first used in 1938, in the Andover public schools, under the superintendency of the late Henry C. Sanborn. It has since been adopted as a routine measure.

The examination is held in June, for children who passed their fifth birthday in January or February. Following a notice in the local newspaper in which parents are invited to bring their children to the school for examination, the school nurse makes appointments for the children at fifteen-minute intervals. A half-day is usually sufficient for all the interviews. The procedure is very simple, as compared with that required for giving each child a standard test.

FUNCTION OF A SCHOOL-ENTRANCE TEST

In an urban school in which a new group of children is regularly admitted to the first grade in the middle of the year, it would probably be a waste of time to require the younger entrants to pass an entrance examination. This test is intended for the school which is open to beginners only in September, and in which the youngest child of each entering class is nearly a year

younger than the oldest one. In rural communities it is very common for parents to make application, usually without avail, for the admission to school of children slightly under the age limit. Frequently a child intended by nature to be the youngest member of his class is required to wait until next September, at which time he will enter school as the oldest child in the class. On the other hand, a child just over the age limit may be too immature to profit by group instruction; and it may tax the teacher's resources very heavily to keep him occupied and to prevent him from disturbing the class.

The purpose of this test is to select a few under-age children who stand a good chance of being able to keep up with the class. In the Andover schools it has been used six years, with slight modifications each year. During this time only one under-age child admitted on the strength of this examination has been required to repeat the first grade; and his score was much lower than the score later adopted as the minimal acceptable score.

TEXT OF THE TEST*

(With suggested weighted values, based on percentage of correct responses obtained from the first 100 children)

	per cent
1. Which is larger, a cat or a kitten? (2)	67
2. Which is larger, a horse or a dog? (2)	71
3. Which is larger, a cow or a sheep? (2)	61
4. Where do fishes live? (2)	86
5. At what time of year do we go swimming? (3)	59
6. What makes it warmer in the daytime than at night? (3)	57
7. What color is grass? (1)	91
8. What color is an apple? (1 plus)	94
9. What color is a banana? (2)	71
10. At what time of year is it very cold? (2)	62

* This form may be used for mimeograph copy, with or without the point values. Additional questions, if desired, may be found in *Detroit Tests of Learning Aptitude* (1), Test 10, "Orientation"; and these or any other supplementary questions may be given arbitrarily weighted values. The Detroit items especially recommended are numbered: 1, 2, 3, 4, 5, 6, 11, 14, 16, 24.

	per cent
11. Tell me something that has wings. (2 plus).....	87
12. Does Fourth of July come in summer or in winter? (3).....	52
13. Which goes faster, a car or a horse? (2).....	65
14. Which goes faster, a train or a bus? (2).....	73
15. Which goes faster, a bicycle or a scooter? (2).....	67
16. Can your shadow run as fast as you can? (2).....	61
17. What does ice become when it melts? (3).....	50
18. Does Christmas come in winter or in summer? (2)..	65
19. What makes it light on a rainy day? (3).....	38
20. If today is Sunday, what will tomorrow be? (3)...	30
21. How many wheels has a wheelbarrow? (3).....	58
22. How many wheels has a scooter? (2).....	79
23. Tell me something that has four wheels. (2 plus)...	70
24. What do we hear with? (2).....	69
25. What do we use our eyes for? (2 for see, 1 for look)	62

ANALYSIS OF ITEMS

Ideal questions for this test, as indeed for any test, are very scarce. The following criteria, similar to those used in the development of the 'Emergency Test'[2], have been observed as far as possible in the selection of these questions:

1) The five to six-year mental level should be covered by a narrow margin. Any question which brings an invariably correct or an invariably incorrect response from the first six children to whom it is presented may be discarded as having little or no discriminative value at this particular mental level.

2) Each question should be tersely stated, making minimal demands upon the child's comprehension. No word or word-combination should be difficult of enunciation.

3) Each question should call for a response sufficiently distinctive in sound to be easily understood when spoken by a child having a slight speech defect.

4) The best question is one that can be answered in a single monosyllabic word. Frequently a one-word response can be elicited from a child who cannot be induced to answer a question requiring a three-word response.

5) Performance tasks, if used at all, should not be evaluated by speed and should not require fine motor coördination.

6) The response should admit of being scored numerically and objectively, preferably without the aid of a scoring key. For the most part, there should be only one correct response.

7) Each response should be evaluated as a unit, without reference to any other response. Credit for a correct response should not be forfeited because of a child's failure to answer a related question.

8) The 'direct' question, if used, should usually be answered by 'no,' not by 'yes.'

This test contains eight questions calling for one of two specified responses, the correct one invariably being placed first in the question. As long as the Binet scale has been in use, it has been generally recognized that a young child shows a marked preference for repeating the last word of the question, even when he knows that it is not the correct answer. This preference is what makes the 'dilemma' question useful at the five-year level. A dilemma question calling for a higher level of information is of little value in tests for older children, because the correct response may be nothing more than a lucky guess. In early childhood the tendency to repeat automatically the last word of the question is so strong as to be overcome only by active resistance to the suggestion; and, therefore, the correct response may be accepted at face value.

These dilemma questions are intended to be within the child's range of information, and are used as a check on his attention. The child who states that a dog is larger than a horse presumably knows better, but he is held responsible for answering as well as he can. One of the 1940 examinees scored a zero on every dilemma question in the series, invariably giving his response with confidence and satisfaction. Mental retardation was not suspected, but his score fell far short of the passing score. The child who is recommended for school placement in the grade with children several months his senior should give better proof of his capacity for attention.

In the arrangement of items great care must be taken to avoid giving the child a direct clue to some response. In this series the four groups of similar questions (larger, color, faster, wheels) served as a framework for the set-up; two questions which any

five-year-old child might be expected to answer with ease were reserved for the close of the series; the two questions calling for the response 'water' were widely separated, also the two questions for which the correct response is 'the sun'; and both questions calling for the name of a season were placed ahead of the two questions in which summer and winter are referred to by name.

The three questions beginning "which is larger" were placed first, on the supposition that they were among the easiest questions of the series. The results show a slightly higher percentage of correct responses for the group beginning "which goes faster," but it does not follow that children of this age are more observant of speed than of size. The 'faster' questions appear to have the advantage of their place in the series. Several children answered all the 'larger' questions incorrectly, with amazing complacency, and yet earned a full score on the three 'faster' questions; and the highest total score on record shows a zero for the first question. A dilemma question is perhaps a little unfair for opening the examination, inasmuch as it may be too conducive to the automatic repetition of the last word used by the examiner. Most of the questions between these two groups call for responses not included in the questions; and it is possible that these intervening questions furnish enough intellectual stimulation to elicit better attention from the child by the time the second group of dilemma questions is reached.

As a means of building up a child's self-confidence it is important to open the examination with a few questions which he can answer to his own satisfaction, but it is not essential that they be answered correctly. These questions beginning "which is larger" usually bring unhesitating responses, and on this ground they are acceptable as opening questions.

INSTRUCTIONS FOR PRESENTATION

The only essential rule for presentation is that the examination be made strictly uniform for all the children of a given group.

It is permissible to open the examination with introductory questions which are not to be scored, if they be used uniformly for the group. The question, "Which do you like better, ice-cream or spinach?", was used for one group of twenty children, but the results offer no conclusive evidence that it was helpful

in catching their attention. Seven of the twenty expressed preference for spinach; and of the thirteen who resisted the suggestion to repeat the last word used by the examiner, six reverted to the automatic response for at least one of the 'larger' questions.

The test holds possibilities for classification of children already in school, but it may require a little modification to bring it up to the six to seven-year mental level. Any examiner is free to omit questions not considered useful and to insert additional questions which meet the basic requirements; but in the arrangement of the questions, care should be taken to observe the principles referred to above.

Any liberties which are to be taken with the questions should be decided upon in advance; and there should be no deviation in presenting the test to any individual child who is examined as one of a group. New questions which are to be tried out experimentally should be reserved until the close of the formal examination. After the completion of the series which yields a score, experimental questions may be used as freely as time permits. Naturally, the children who respond most readily and spontaneously are the ones who make the best subjects for experimental try-out of additional questions. Having on hand a little extra work for the children who respond well serves both to enlarge the test and also to equalize the time spent by the children in the examining room.

Some children adapt themselves instantly to the situation and take full advantage of the opportunity to display their attainments; whereas other children, not necessarily less intelligent, are so shy and uneasy that it requires all the examiner's powers of persuasion to obtain an audible response. It is possible, without any verbal deviation from the form of presentation, to give the timid child a little encouragement according to his needs. A question which does not bring a prompt reply may be repeated, slowly, as if on the assumption that the child may have failed to understand it. If the repeated question still fails to bring a response, it is well to pass on quickly to the next question. A long pause tends to make the child self-conscious.

It is not recommended that a child who names one color of an apple or one thing having wings be pressed for a further response. It is true that an additional response can occasionally be obtained

by encouraging a child to go on and name something else; but there are children who can hardly bear the least hint that a response is not wholly satisfactory. The fact that some children are unduly sensitive to an implied criticism makes it difficult for the examiner to present the request for an additional response with strict uniformity, and therefore it seems better to be satisfied with a single response. Multiple credit is for those who earn it by spontaneous mention of more than one item.

In general the response should be accepted tacitly as if correct. On no account is it permissible to praise an incorrect response, thus giving the child false information; nor is it desirable to praise every correct response, as this would lead the child to infer that a response received in silence is not satisfactory. Some children require extravagant praise at the beginning, perhaps for the first two or three correct responses; but after the habit of responding is established, the encouragement may be better expressed by the tone in which the next question is presented.

EVALUATION OF RESULTS

The weighting system offered is tentative and subject to revision. It is derived from the first one hundred cases, including four small groups of Andover children and any other children (under seven and over four and one-half years of age) who happened to be available as subjects. Strict uniformity of presentation is not claimed for all these children, but merely for each group examined as a group. The procedure recommended has been of gradual development over a considerable period, and has not been long in actual use.

This scoring system allows one point credit for responses given correctly by upwards of ninety per cent, two points for responses given by sixty to eighty-nine per cent, and three points for responses given by less than sixty per cent of the children. The perfect score, in the sense of a correct response to each question, is 55; but a child may earn a slightly higher score by means of multiple responses. The scores now on record range from 5 to 54.

It is not essential that the scores be weighted at all; nor does it greatly matter whether the weighting, if any, be statistical or arbitrary. Two-point credit is convenient in that it permits half credit for an inferior response, as is indicated for question 25.

(Of the eighty-nine children who responded to this question, sixty-two answered "see" and 27 answered "look.") It could make little difference in the results as a whole if a flat-rate credit of two points were allowed for each correct response. It would still be permissible, at the discretion of the examiner, to deduct a point for a response that is clearly inferior or to allow extra credit for one which is more than adequate.

Almost any system of evaluation may be used, if it be followed consistently for all the children of a given group. If suitable questions were more abundant, it might be desirable to eliminate every question which elicits responses of doubtful value; but so long as such questions are retained, the examiner may assume full responsibility for scoring them. In view of the importance of giving equal opportunity of success to all the children of the group, it is perhaps desirable that each examiner build up individual and personal criteria of evaluation. One can adhere to a system of one's own far more easily and more exactly than one can follow a system formulated and recommended by someone else; but when two or more examiners are to participate in the examination of a given group of children, it is essential that they have a clear understanding concerning the scoring of responses.

The child's final score is the sum of the scores he has earned on the twenty-five items. The total scores for the group are arranged in order of rank, and the children are divided into two or more subgroups on a strictly numerical basis.

The 'passing' score for school entrance is a variable, depending upon the following factors: the age limit for children accepted without examination; the number of seats that can conveniently be used by under-age children; and the superintendent's wish to include all the children who can keep up with the class as balanced against his wish to include only those. Also, the score will be influenced by whether the examination is held in June or in September.

At Andover it is definitely understood that the passing score is relative, not absolute. The standard for passing has been raised since the test came into use, but the score is decided upon only for a given year and only after all the children have been examined. The number of children accepted has always been more than half of those brought for examination. The scores usually show a wide spread; and frequently a wide interval

between two adjacent scores in the series forms a natural dividing line.

THE UNSTANDARDIZED TEST FOR SCHOOL ENTRANCE

It is in no way essential that the test used for group classification be so standardized as to yield individual ratings, as a child's place in the group is more important than his individual rating by an absolute standard. After having used both standard and non-standard tests for school-entrance examinations, the writer is prepared to call attention to certain advantages of the non-standard test, other things being equal:

1) *Reactions of parents.* In most cases the child is brought to the examining office by his mother. In many cases the mother has been expecting to be present at the examination, and has been counting on an opportunity to give her child a little unobtrusive coaching. The separation of mother and child may be as upsetting to the mother as to the child, and for a longer time. The child quickly learns that the examination is nothing to be feared; but the mother, waiting in the room outside, is under high tension for its entire duration. When the door is opened she approaches the examiner anxiously with the whispered questions: "Did he pass? What is his IQ?" The examiner can tell her in all honesty that the record will have to be scored before her first question can be answered. It is highly desirable to be able to tell her further, also honestly, that this is not an intelligence test and that it does not yield an IQ. If time permit, it is worth while to explain to the mother: that a child's readiness for school instruction depends largely upon his social maturity; that this very simple test offers some indication as to what sort of response a strange examiner—or a strange teacher—will be able to get from him; that the brightest child in the group will certainly fail to pass if he is too frightened to give attention to the questions; and that a child's failure to pass should not be taken to indicate anything more serious than that before starting school he needs another year in which to grow older and to become a little less dependent upon his mother.

It has been found that parents accept this explanation far more calmly than they accept a child's failure to pass a standard test concerning which they may possess a little information and usually more misinformation.

2) *Impartiality of the examination.* It is convenient to be able to assure the disappointed parents that the examination is identical for all the children of the group. They frequently inquire about this, and are not satisfied with anything less than a categorical answer.

If the Stanford-Binet scale (3, 4) or any similarly-standardized scale were presented with strict uniformity to all the children of the group, each examination would be unduly time-consuming and fatiguing. Any group is almost certain to include some children who will score at seven years and other children who will require the three-year level as a 'basal,' thus necessitating complete three to eight-year coverage for each child.

Flexibility of presentation is highly desirable in a test used for individual study, but this factor makes it less serviceable for group classification. The most fair and impartial test for group study is the simple point scale which can be presented in its entirety to each member of the group.

3) *Modification of the test content.* A test which is not intended for standardization may be subjected at any time to whatever revision or modification may be indicated. When preparing the forms for each new group, the examiner is free to take advantage of all past experience in the use of the test. The 'Andover' test has been modified as many times as it has been used for group classification, and it can be still further improved by everyone who uses it. Inasmuch as there are no norms to be invalidated by deviation from a standard procedure, each and every examiner may be encouraged to make it a better instrument. This is by far the most important advantage of the unstandardized test.

4) *Economy of time.* The standard test is almost inevitably wasteful of time in its application to the individual subject. Intended to cover a wide range of mental levels, it necessarily contains matter which is too easy for some subjects and matter which is too difficult for others. But when a test is prepared for a group of subjects whose approximate mental level is known in advance, it is economical to omit all non-discriminative matter and to make the range just wide enough for adequate coverage. Standardization as such would not make the narrow-range scale more time-consuming; but it would be uneconomical to standard-

ize a test for limited range and limited serviceability. It does not require norms for its own purpose.

SUMMARY

For the school-conducted examination of under-age children whose admission to school is dependent upon test results, it is convenient to use a test of narrow discriminative range scaled in difficulty to the five to six-year mental level. The 'Andover' test has been used repeatedly for examination of a small group of children about five and one-half years old, and has been revised following each use. The twenty-five questions offered have been selected from one hundred and eight items that were tried in the preliminary stages.

Although individually presented, the test is essentially a group test. All responses are numerically scored, and the sum of the scores constitutes a child's final score. The total scores for the children of the group are arranged in order of rank, and the group is divided into subgroups. The 'passing' score for school entrance is a variable, depending upon the number of seats available in first-grade rooms.

This method of selecting a limited number of under-age children for admission to the first grade is more impartial than is a standard test which yields an individual rating, and is more acceptable to parents. It is recommended also as being economical of time.

The test may be modified freely by any examiner, to meet the needs of any particular group of children. So long as the procedure is kept uniform for all the children of a given group, it is not essential that it be identical for any two groups. The examiner who uses the test habitually year after year has unlimited opportunity to develop it and to make it a more serviceable instrument. It is recommended that the record forms be mimeographed rather than printed, in order that the test may more easily be revised as indicated.

The list of questions, with the addition of a few more difficult ones, has possibilities for classification of first-grade children with reference to division into sections.

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BOOK REVIEWS

MARK VAN DOREN. *Liberal Education*, New York: Henry Holt and Company, 1943, pp. 186.

The fact that Van Doren wrote this book at the request of the Association of American Colleges means that it will be read carefully by many people. The author did not concern himself with a liberal education for the few but with a liberal education for everyone. The argument for the extension of educational opportunity to all, even through the college, was most persuasive and Van Doren seemed to base his belief that the state should educate all of its adolescents upon a realization that it takes time to develop good democrats by teaching them the love of truth and the importance of thinking well. One reason this takes time is that the good state "does not achieve its ends by pretense or coercion or by conspiracy to confuse the attempts with the deed." (p. 38). The author believes that democracy needs no special pleading; that it will be chosen as a way of life because of its fruits if enlightenment prevails. While the reviewer shares this conviction, he is not impressed with the faith the present leaders of great democracies have in the happy consequences of telling us little democrats the truth. It may well be, as Van Doren states, that the good state will exist only "at the end of history." (p. 42). If that means anything it means a long time hence.

The author realized early in his inquiry that no amount of intuition would produce a good discussion of the liberal 'discipline' unless some thought was given to the nature of a well-educated person. Consequently, the first substantial chapter is devoted to that problem. The educated man, it is claimed, "knows what he is doing," he has "substituted learned ignorance for natural ignorance," (Pascal), he is one "who can best endure the good and evil of life . . . ," (Rousseau), he is "committed to reason,—really committed," he has "a general sense of what, under various disguises, superiority has always signified and may still signify," (William James), he is "one who tries to understand the whole of knowledge as well as one man can," (Meiklejohn), he "knows how to read, write, speak and listen," he "recognizes no dry stretch between now and then," he is

"neither scared by novelty nor bored without it," and he knows "what it means to say that eternity is most like the present."

Despite the fact that these statements about the nature of an educated man were buttressed with quotations from the great and near-great books, they left the reviewer asking: "But what does the educated man do? Education is to make men live differently. How must they behave to make this world a better one?" To say that the educated man must be a 'just' man is to leave the major question unanswered. The major question is: How do just people operate? Everyone probably thinks he is just; or at least there is reason to believe that at present the Japanese and the Germans and the Russians and the English and the Americans, all think they are just, and yet they do conflicting things. To contend that only quibblers argue about the meaning of justice does not seem to constitute even a strategic retreat. If the search for the great and never-changing end of all education has turned up no more than an unchanging word whose meaning varies greatly from time to time and from person to person, then the quest was a fruitless one. Milton's great tautologism: "I call, therefore, a complete and generous education that which fits a man to perform justly, skillfully, and magnanimously all the offices both private and public of peace and war," (p. 66) merely emphasizes the point.

Not having made sufficiently explicit in terms of behavior just what the well educated man should do, Van Doren's discussion of the liberal education was of necessity couched in excellently phrased generalities about the virtues and weaknesses of classical education (reading books written by Greeks and Romans), literary scholarship (reading books written by others), the humanities (reading books about letters and history and art), and the sciences (reading books written by great scientists). The liberal education was viewed consistently as a body of subject-matter to be learned.

The great climax of Van Doren's discussion is his idea about a college. "The future of American education, like its past, is bound up with the institution we know as a college." (p. 106). And the college is its curriculum. The author seemed to imply that there would be relatively little argument among thoughtful educators about the character of the good citizen but that the real controversy centers on how the state can make good citizens.

In other words, the debate is about means and not ends and in Van Doren's opinion the means, or at least the means in the sense of a college curriculum, should be uniform and universal and fixed. (p. 110). The reviewer concludes that the ideal college curriculum then, being uniform and universal, must be the same for the Kwoma, the Russian, the Hindu, the Tibetan, and the Eskimo, as for the middleclass American youth with a high IQ. Van Doren insists finally that college education should be limited to reading "the great books" or acquiring whatever skills are ancillary to this end.

In discussing the college curriculum of great books the usual claims for the classics are made,—that they are not essentially difficult, that most of them were written for everybody and that, "a classic is always fresh, vernacular, sensible and responsible." (p. 153). The fact that most of these classics were written at a time when only the intellectual 'upper-uppers' could read was not elaborated. Those who argue, like Van Doren, that the classics can be read with great profit by everyone, are, as did Aristotle when he was concerned about the number of teeth in the human head, disdaining the only court of appeal that makes sense; namely, the people who try to read the books or in the case of Aristotle's 'research' the people who have the teeth. Plato and Cicero and Epictetus and Ptolemy and Descartes and Hume and Freud and Bentham and Marx and Veblen were not writing for callow boys and girls in their late adolescence. They were writing primarily for their peers and exclusively for well-educated (?) and mature adults. Bright American young people can learn the words these authors use, and under the tutelage of distinguished teachers of broad experience like Van Doren or Hutchins or Buchanan or Adler, they can reach some understanding of what the words mean in terms of human experience. The reviewer even believes that reading Horatio Alger or the Sears and Roebuck Catalog with teachers of the calibre of these four gentlemen could be most educative. But to insist that colleges for all young people should consist of one long wrestling bout with words whose meanings for them are rooted in hopelessly inadequate first-hand experience is to flee from reality, or at least to flee from the great majority of American youth who sorely need a liberal education that will mean something to them.

Education that counts, and by this the reviewer means education that influences the way people live, not only the way they talk, has to be an education that results from trying to do something about situations that matter to the learner. Education, of course, is more than merely doing something. It is, in the last analysis, a name for the organized generalizations and principles and understandings and attitudes that some men infer from their actions. If, in the course of their attempts to do something about a situation that matters to them, young people go to the great books for the help that these great books will give, reading them will be educative. But to try to read the great books in advance of experiences that make the problems they deal with significant, is a sterile activity.

In conclusion the reviewer must admit that his views about liberal education were not much clarified or changed by Van Doren's tactful and well-intentioned essay. The selected drippings from the great minds and the general temperance of an author who seemed completely lacking in arrogance were appreciated, but little progress was made toward a solution of the fundamental problems. The fundamental problems of education are two in number. First, how should the good citizen live, what should he do, in what way should he behave; and, secondly, what experiences, not only what books, should he have in order that there will be engendered in him the ideals and understandings and habits that will make him live as he should. Van Doren paid far too great a price for what he termed a rational curriculum—defining rational as having everyone read the same books. He almost completely overlooked the great educational possibilities, even for bright young people, of coping directly with some of their own problems, and of getting out into a modern world which lives, and breathes, and, I suppose, smells.

STEPHEN M. COREY

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HAROLD E. JONES. *Development in Adolescence.* New York: D. Appleton-Century Co., 1943, pp. 166.

This intensive 'longitudinal' study of a boy through the adolescent period from age eleven to eighteen is perhaps one of the most thorough investigations of an individual in the history of psychology. The treatment is not limited in its

perspective, however, since discussion is constantly focussed against the background of a group of children making up the "California Adolescent Growth Study." John Sanders, the subject, was not chosen for special emphasis because he was the typical case of the group, but because he met so many of the problems common to the urban culture from which the group was selected. In general, it might be said that he appears to be somewhat inferior to the mean of the group physically and socially.

The methodology of the study is to lead off with two orienting chapters and then devote separate chapters to the various modes of developmental expression. This type of presentation is much more fertile than a straightforward chronological treatment could be. Thus the book handles the single individual much as the general field of personality is treated in most standard books on adolescent psychology. Titles of the chapters give some idea of the scope of the study: I. Here John Was at Home; II. Into Adolescence; III. John as Seen by His Teachers and Classmates; IV. John as a Member of Social Groups; V. Physical Development; VI. Motor and Mental Abilities; VII. Interests and Attitudes; VIII. An Interpretative Study of Some 'Underlying Tendencies'; IX. John as He Saw Himself; X. The Struggle for Maturity. As can be seen from the chapter headings, the study runs the usual personality gamut of physical, social, intellectual, and emotional life.

Examples of specific types of materials gathered in various areas present an even better idea of how thoroughly and painstakingly the study was made: Classmates' opinions as derived from a 'Reputation Test,' standardized observations of social groups, skeletal developmental charts, basal metabolism records, strength and psychomotor batteries, CAVD, Stanford-Binet, Interest tests, Apperception test, Rorschach, psychogalvanometer, personal-social inventories. Tests and observations were taken again and again in order that adequate developmental schedules could be constructed.

The author has no psychological axe to grind in this treatment of adolescence. No special thesis or school of psychology colors any of the discussion. As a rule, material is interpreted from the practical, matter-of-fact point of view of 'common sense.' Jones' theory of personality is professedly a multifactor one

with special emphasis on the factor of 'struggle for maturity.' However, he has organized the combined efforts of psychologists, physicians, a physiologist, and a school counsellor in a very objective manner. As a presentation of a concrete case in all the manifold aspects of adolescent development, the study provides very useful material for both students and teachers.

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ROBERT W. LEEPER. *Lewin's Topological and Vector Psychology.* Eugene: University of Oregon Publications (Studies in Psychology No. 1), 1943 pp. ix + 218.

It is not easy, either for the student or for the trained psychologist, to achieve a clear understanding of Lewin's systematic views. In part this is due to the fact that there is no single publication that presents his complete system. Furthermore, the concepts involved are difficult, meanings are at times obscure, and certain aspects of the system appear to need revision. Dr. Leeper proposes (1) "to give a clear, compact summary of Lewin's conceptual system, and to show how it is related to the tradition of American psychology, and (2) to suggest some revisions that may be desirable to make this conceptual system more consistent and efficient."

After an introduction in which considerable emphasis is placed upon the rôle of motivation in psychology, a bird's-eye view of Lewin's concepts is presented for newcomers. In chapters 4, 5, and 7, Lewin's concepts are summarized and explained. Where these concepts are obscure, due to confusing statements by Lewin, the author suggests what is apparently meant. Included in the summary are the purposes of Lewin's concepts, topological and dynamic concepts developed by Lewin, and Lewin's concepts of direction and of relationships between directions. Of great importance are the criticisms and revisions of Lewin's (1) topological and dynamic concepts and (2) concepts of direction and of relationships between directions in chapters 6 and 8. The final section deals with Lewin's concepts in the field of motivation as a whole.

Detailed enumeration of Lewin's concepts and Leeper's criticisms and revisions is impossible here. A few of the criticisms and suggestions may be mentioned: (1) It is felt that Lewin

has emphasized too strongly that psychology must deal only with contemporary causal factors. Causes and effects separated considerably in time need to be considered. (2) The concept that behavior is a function merely of life space (treated in terms of events in boundary zones) may be possible theoretically but not pragmatically. (3) It is suggested that "barrier—regions must be defined in terms of the resistance which the person expects he will meet in a given activity." (4) The sorts of predictions necessary for a vector psychology require that definitions of equality of direction specify the conditions under which summations of forces occur. (5) Several serious difficulties are found to be present in Lewin's concepts of direction and of relationships between directions. Redefinitions are given by Leeper.

After noting the inadequate organization of problems in the field of motivation, and the great diversity of topics pursued by various writers, it is pointed out that Lewin's interests also have been directed to only a portion of the whole field. "What is needed is an integration of his work with other work. . . ." Lewin's system seems to provide "a means for integrating the whole range of different types of study in the field of motivation."

Psychologists should be grateful for this clear summary and criticism of Lewin's systematic point of view. The author is highly appreciative of Lewin's contribution but discriminative in evaluating it. Lewin, in a foreward, approves of part of the material but states that Leeper's positive suggestions do not always convince him. The facetious dialogue employed in the introduction and final section will irritate many readers. While the treatise may serve as an introduction to Lewin, it does not eliminate the need of reading his original contributions.

MILES A. TINKER

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PAUL T. YOUNG. *Emotion in Man and Animal.* New York: John Wiley & Sons, 1943, pp. 422.

The central point of reference of this book, which is primarily designed as an undergraduate text, is the individual who experiences an emotion and reveals it in behavior. Starting with a discussion of the nature of emotion, the author proceeds to describe how attitudes and motives determine emotion and how

emotions are developed, expressed and subjectively experienced. An emotion is defined as "an acute disturbance of the individual, psychological in origin, involving behavior, conscious experience and visceral functioning." In accord with this definition emotions are regarded as disruptive rather than adaptive processes. Although this interpretation may be warranted with respect to such emotions as fear and anger, one may question whether they apply to the pleasant and milder emotions.

The book is well written and contains many illustrations of emotional reactions in animals and children. The excellent summaries at the end of each chapter add to the attraction of the book for classroom use.

JAMES D. PAGE
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ARTHUR E. MURPHY. *The Uses of Reason.* New York: The Macmillan Co., 1943, pp. 346.

Mr. Murphy has a great deal of confidence in man's ability to reason through to a solution of his problems and in this book he summarizes his views on how best this reasoning can be accomplished. The argument is divided into four parts, The first is a discussion of the age-old question of the relation between reason and truth. The author accepts with some reservations the pragmatic test of truth; namely, that it works. His reservations are chiefly temporal in that he would insist upon the use of some historical perspective in determining the validity of 'truth' by examining its operational consequences. The second section of the book deals with practical reason and the author summarizes his point of view thusly: "No man is as good as he ought to be unless, within the limits of his capacity and condition, he is doing his best, and no man is doing his best unless he has used such intelligence as he has, as well as his 'conscience,' to guide him in making his actions appropriate to and effective in the circumstances of its performance." (p. 135, and rather indicative of the general expository style!)

Part Three is concerned with reason and social action. The chief characteristics of the socially effective use of reason are alleged to be: 1) reliable information, 2) some future reference, 3) coöperation, 4) concern with practical ends, 5) morality, and 6) liberalism, in the sense of the consent of the person affected by a change. In the final section Murphy illuminates the philo-

sophical uses of reason. He recognizes that his proposal that men 'reason' is a difficult one, but he agrees with Spinoza that everything excellent is both rare and difficult. One of the factors that makes the study and practice of philosophy difficult, is that the philosophic discipline cannot be aloof and claim immunity from the hazards and lessons of history.

If, as the publishers state and the author implies, this book was written, not for the specialist or for the technician, but for the layman, the reviewer believes the mark was somewhat overshot. It is of little consequence how many superb ideas an author has developed if they are not communicated to the audience for which they were intended. Murphy had fine intentions and he wrote thoughtfully and well about important problems, but his volume will be read by very few common people. The vocabulary load is too heavy and the typical sentence too involved.

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